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LIX. *Astronomical Observations made at the Island of Barbados ; at Willoughby Fort ; and at the Observatory on Constitution Hill, both adjoining to Bridge Town. By Nevil Maskelyne, A. M. Fellow of Trinity College, Cambridge, and F. R. S.*

[Read December 20, 1764.]

*N. B.* All the observations of the first satelkite of Jupiter were made with a two foot reflector made by Mr. Bird, having an aperture of  $3\frac{8}{9}$  inches in diameter, except where they are marked as made with my 18 inch reflector made by Mr. Short, having an aperture of four inches and an half in diameter. And the eclipses of the other satelkites were all observed with the 18 inch telescope, except a few marked as made with Mr. Bird's two foot reflector. The latitude of Willoughby Fort is  $13^{\circ} 5' N.$  and that of the Observatory  $13^{\circ} 5' 15'' N.$  This agrees with the latitude I observed when our ship came to anchor at our first arrival in Carlisle Bay, which, carefully calculated, and reduced to St. Michael's Church, gives  $13^{\circ} 5' 30''$  for its latitude. The Observatory is about 200 yards due east of the church, and Willoughby Fort is about 1600 feet distant from the same, bearing S. W. So that the Observatory is about  $15''$  of longitude, or  $1''$  of time to the east of Willoughby Fort. The latitudes of Willoughby Fort and the Observatory, set down above, result from altitudes of the sun taken with a bason of quick-silver by the brass Hadley's sextant made by Mr. Bird, being calculated from them, and the apparent time known from equal altitudes of the sun taken with the equal altitude instrument.

App <sup>t</sup> Time.			
	H	At WILLOUGHBY FORT.	
1763			
Nov.			
☉ 13	15 5 38	Immersion of 1 <sup>st</sup> Satellite of Jupiter.	
♀ 18	5 44 41	{ ☉ set totally, or his upper limb set in the sea, height of my eye above the sea about 10 foot.	
☉ 20	{ 13 21 15:	Imm. 2 Sat. of Jupiter. Air hazy and moon-shine.	
	{ 16 57 20:	Imm. 1 Sat. of Jupiter through thin clouds.	
♂ 22	11 26 6	Imm. 1 Sat. of Jupiter.	
♂ 24	13 52 29	{ Emerfion of ♄ Canceri four magn. from the moon's dark limb, dubious to 5'', by taking my eye off the telescope for 10''.	
Dec.			
♂ 1.	7 46 0::	{ Imm. 1 Sat. of Jupit. 18 inch telescope, magnifies 170. Air hazy; yet the fatellite was separate from the body of Jupiter.	
♂ 6	{ 12 10 45	Emerf. 3 Sat. of Jupit. 18 inch magnifies, 170.	
	{ 17 21 4::	Emerf. 1 Sat. of Jupit. low towards the horizon. 18 inch telescope.	
♂ 8	{ 10 24 55	Emerf. 2 Sat. of Jupit. } 18 inch { Sat. at a sensible.	
	{ 11 46 35	Emerf. 1 Sat. of Jupit. } mag. 170 { Sat. at a very sensible distance from Jupiter's body.	
♂ 15	{ 12 59 46	Emerf. 2 Sat. of Jupiter.	
	{ 13 37 9	Emerf. 1 Sat. of Jupiter.	
♂ 17	8 5 46:	Emerf. 1 Sat. of Jupiter. Air hazy.	
♂ 21	14 12 0	{ A small telescopic star preceded Jupiter's centre 1.' 34'' in right ascension, and was 7'' N. of the same in declination.	
♂ 22	{ 15 28 35	Emerf. 1 Sat. of Jupiter.	
	{ 15 35 35::	{ Emerf. 2 Sat. of Jupiter. 2 foot telescope. Almost touched the 1 Sat. at the emerfion.	
♂ 24	9 56 20	Emerf. 1 Sat. of Jupiter.	

		At the OBSERVATORY.	
1764			
Jan.			
♂ 7	13 39 43:	{ Emerf. of 1 Sat. of Jupiter. Air a little hazy, but Jupiter sufficiently bright.	
	{ 8 7 20	Emerf. 1 Sat. of Jupiter.	
♂ 9	{ 8 31 18	{ A telescopic star (inserted in Senex's map of the Zodiac) in the line of the moon's horns produced, and $\frac{1}{2}$ a minute distant from moon's south horn.	
	{ 10 2 8	Emerf. of 2 Sat. of Jupiter.	
♂ 16	{ 9 59 38	Emerf. of 1 Sat. of Jupiter.	
	{ 12 37 59	Emerf. of 2 Sat. of Jupiter.	
♂ 18	{ 9 47 46	Imm. of 3 Sat. of Jupiter.	
	{ 12 0 13	Emerf. of 3 Sat. of Jupiter.	

		App <sup>t</sup> Time		
1764		H		
Jan.				
h	21	{	10 59 28 11 23 18	<p> <math>\alpha</math> Leonis (which was occulted by the <math>\triangleright</math> this night in Europe) precedes <math>\triangleright</math>'s subsequent limb in right ascension by the parallactic wires of my 18 inch telescope. </p>
$\triangleright$	23		11 52 36	Emerf. of 1 Sat. of Jupiter. Emerg'd instantaneously.
$\delta$	25		6 20 51	<p> { Emerf. of 1 Sat. of Jupiter. A good observation; though only 40' after sun set, sufficiently dark. </p>
Feb.				
$\delta$	8	{	9 43 24 10 9 19	<p> { A star 6.7 magn. in Aries, in line of <math>\triangleright</math>'s horns, produced 1' S. of <math>\triangleright</math>'s fourth horn. Certain to 10''. </p>
$\delta$	17		8 24 39	Emerf. of 1 Sat. of Jupiter.
$\triangleright$	20	{	11 50 32 12 7 6 15 7 37	<p> { Occultation of <math>\gamma</math> Leonis 6 magn. by <math>\triangleright</math>'s bright limb, certain to 5''. Full moon this day. </p>
				The Virgin's spike precedes $\triangleright$ 's subsequent limb in right ascension by parallactic wires.
				Ditto by transit instrument upon the meridian
				N. B. The Virgin's spike was occulted by the $\triangleright$ this night in Europe.
		{	7 54 8	Internal contact of one of Jupiter's satellites, with his east limb at its entrance upon his body.
$\alpha$	23	{	7 54 44 8 5 3	Sat. disappears. Suppose it has been visible 36'' upon his body.
			13 48 46	Emerf. of 3 Sat. of Jupiter.
$\delta$	24		8 30 42	Antares follows $\triangleright$ 's subsequent limb in right ascension by parallactic wires of 18 inch telescope.
March				
$\delta$	6		7 5 12	Emerf. of 2 Sat. of Jupiter. Air very clear.
$\alpha$	8		7 2 43	Emerf. of $\epsilon$ Pleiadum from the $\triangleright$ 's bright limb, certain to 10''.
h	10	{	7 21 46 9 24 49	<p> <math>\beta</math> Tauri, 2 magn. precedes <math>\triangleright</math>'s preceding limb in right ascension by parallactic wires. </p>
$\triangleright$	12	{	9 49 22 $\frac{1}{2}$ 11 9 15	Occultation of $\nu$ Gemini 5 magn. by $\triangleright$ 's dark limb.
$\delta$	13	{	7 56 7 9 13 29	Emerf. of ditto from $\triangleright$ 's bright limb, certain to 10''.
$\delta$	16		11 17 18	Occultation of 2 $\nu$ Cancr by $\triangleright$ 's dark limb.
$\delta$	17		6 41 28	Occultation of 3 $\nu$ Cancr by $\triangleright$ 's dark limb.
Eclipse of $\triangleright$		{	7 26 11 7 36 29 9 26 50	<p> Occultation of <math>\sigma</math> Leonis 4.5 magn. by <math>\triangleright</math>'s dark limb. </p>
				Beginning of the eclipse of the $\triangleright$ .
				Shadow at middle of Mount $\mathcal{A}$ etna.
				Shadow of the middle of Mount Hercules.
				End of the eclipse.
N. B. I observed the beginning and end with an opera glass of Dollond's construction.				

		App <sup>t</sup> Time	
1764		H	"
April			
♀ 6		8 28 11	Emerf. of 3 Sat. of Jupiter.
		8 33 30	3 Sat. arrived to its greatest brightness.
♀ 13	{	13 2 32	Imm. of $\beta$ Virginis into $\mathfrak{D}$ 's dark limb.
		13 48 48	Emerf. of ditto from $\mathfrak{D}$ 's bright limb, certain to 10".
☉ 15		7 19 17	The Virgin's spike precedes $\mathfrak{D}$ 's preceding limb in } 49.' 43."
			right afcenfion by parallactic wires.
			N. B. It was occulted this night in Europe.
May			
♄ 10		7 7 47	Imm. of $\sigma$ Leonis 4.5 magn. into $\mathfrak{D}$ 's dark limb.
June			
♄ 6	{	7 41 4	Imm. of $\chi$ Leonis 4.5 magn. into $\mathfrak{D}$ 's dark limb.
		8 53 33	Emerf. of ditto from $\mathfrak{D}$ 's bright limb. Certain to 5".
♄ 14		11 13 14	$\tau$ Sagittarii 4 magn. precedes $\mathfrak{D}$ 's subsequent } 1.° 8.' 46"
			limb in right afcenfion by parallactic wires.
July			
♄ 9	{	9 51 56	Antares follows $\mathfrak{D}$ 's preceding limb in right ascen- } 3.° 8.' 48"
		13 22 27	fion by parallactic wires. } 1 32 0
♄ 12	{	8 39 11	$\tau$ Sagittarii 4 magn. prec. $\mathfrak{D}$ 's prec. limb in right } 6 21 33
		10 31 23	afcenfion by parallactic wires. } 7 9 19
Aug.			
☉ 5		9 1 28	Occultation of $\pi$ Scorpii 3 magn. by $\mathfrak{D}$ 's dark limb.
♀ 10	{	7 41 43	{ Occultation of $\chi$ Capricorni 6 magn. by $\mathfrak{D}$ 's dark limb, but
			which was fo near to being full, that the star feemed to vau- nifh in the illuminated arch terminating light and darknefs.

Besides the above observations, I have taken a great many of the difference of right ascension between the  $\mathfrak{D}$ 's enlightened limb and proper stars (which I have not yet reduced) by means of parallactic wires in the focus of my 18 inch reflecting telescope; from which, after making the requisite calculations, I make no doubt of being able to deduce the moon's horizontal parallax in that latitude, and thence, by proportion, the equatorial parallax of the moon with great exactness, which has never been done yet in so direct a manner.